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Easily decomposable pyrite is not pure, but is intimately mixed with marcasite, probably in the most minute, *i.e.*, molecular condition. The more rapid alteration of marcasite is supposed to be due to the open structure of the mineral in consequence of the interlacing of twinned crystals, etc.—Mr. Dunnington[1] thinks that the origin of the massive oxides of manganese may be explained by reference to the well-known dissolving effect of sulphate solutions upon manganese compounds. The sulphates may easily have been derived by the decomposition of pyrites. This theory would account for the great depth at which certain deposits of manganese ores are found, and their concentration in masses.—In an article extending through several numbers of *Nature*, Lockyer[2] gives an interesting résumé of the state of our knowledge in regard to meteorites—their structure, composition and origin.—Rauff[3] announces the invention of a new rock slicing machine, and an instrument for cutting crystals parallel or perpendicular to any given natural face.

BOTANY.[4]

A FEW NOTABLE WEEDS OF THE NEBRASKA PLAINS.—In examining the constitution of various floræ one is struck by the fact that with the other changes there is a notable change in the weedy plants as well. Of course a "weed," from a botanical standpoint, is as reputable a plant as any other. It is in fact but an eminently successful organism in the struggle for place, and on this account it is to the botanist much more interesting than the ordinary plants which jog along in a mediocre way, neither advancing nor falling much behind under our observation. Upon the Nebraska plains, the plants which push themselves into place so prominently as to be called "weeds" by the farmer, are partly natives, and partly introduced species, some of which have come in from the southwest within a comparatively recent period, while others have come along with the tide of immigration from the eastern part of the continent, and from the old world.

The plant which, all things considered, is the worst weed, from the popular point of view, is doubtless the Sand-bur (*Cenchrus tribuloides* L.), a peculiar grass of variable habit. As mostly seen, growing almost horizontally from their bases, but when grown in a dense mass it is a tall, erect grass, reaching the height of eighteen to twenty-four inches, or even more. The heads consist of numerous it is a small plant of a spreading habit, the short flowering stems often spiny flower clusters, which become easily deciduous upon the ripening of the seeds. The spines cause these to adhere tenaciously to the hair of animals or to the garments of the passer-by, and when abundant it is almost impossible to remove them until by hard usage the spines have become worn and broken. The seeds are thus carried long distances before being dropped. The plants thrive upon any soil, from the almost barren sands of the rivers to the rich loam turned up by the railway builders in making their embankments. I am of the opinion that the Sand-bur originally grew upon the sandy islands and banks of the Republican, Platte, Loup, Elkhorn, Niobrara and Missouri rivers, and that from them it has spread since man has broken the tough sod of the plains. It could not compete single-handed with the wild grasses, but as soon as the farmer began his warfare against the latter, the Sand-bur found and improved its opportunity for extending its habitat. The farmer has unintentionally and unconsciously given it the opportunity of going up and taking possession of the land.

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[1] Amer. Jour. Sci., Sept., 1888, p. 175.
[2] Ib., Sept., 1888.
[3] Neues Jahrb. f. Min., etc., 1888, ii., p. 230.
[4] Edited by Prof Chas. E. Bessey, Lincoln, Neb.

Buffalo-bur (*Solanum rostratum* Dunal) is the only appropriate name given to a pest which is rapidly increasing all over the plains. The prickly plant and fruits are almost as troublesome as the Sand-bur. I have seen fields in south central Nebraska almost completely filled with Buffalo-burs. What its original habitat was I do not know, but certain it is that now the plant is accommodating itself to the new conditions brought about by the cultivation of the soil.

The sunflower of the plains is the original of the ordinary sunflower of the gardens (*Helianthus annuus* L.). It is found everywhere, and varies in height from a few inches to fifteen feet or more. Upon the unbroken prairies in the White River country of northwest Nebraska I have seen it growing with the prairie grasses, where it consisted of a single erect stem, not more than ten or twelve inches in height, and bearing a single small flower head. Near by, where the soil had been somewhat broken, as by the washing of water, the pawing of buffaloes, the passage of a wagon, or any other cause, the plants were taller, and with a few branches. Upon the mounds made by the prairie dogs, pocket gophers, and ground squirrels, the plants were still larger, approaching the vigor of vegetation shown by them in the eastern parts of the State. In the settled portions of the State the sunflower grows to a great size, and produces a multitude of branches and flower heads. I have often seen plants whose diameter (measured from the tips of the branches on each side) was fully six feet, and whose height reached twelve to fifteen feet. It is a curious fact that all over the plains there is a tradition that the sunflower was introduced by the Mormons, who scattered its seeds by their trails, in order to enable the faithful who came later to follow their tracks. It is scarcely necessary to say that this is an error. The sunflower doubtless sprang up in abundance along the Mormon trail, and marked it, but so it did along every trail where the sod had been broken enough to give the plants a better opportunity for growth.

Squirrel-tail grass, as it is called in the books, and in classes in botany, or "Tickle grass," as known to the farmers (*Hordeum jubatum* L. of the botanists), is one of the most abundant of the weedy grasses of the plains. It appears to have originally grown along the sandy margins of rivers, and upon the bare ground about ponds and salt springs, from whence it has spread rapidly to road sides and fields since the advent of white men. It is not naturally one of the prairie grasses proper. In fact, as it is an annual, it cannot compete successfully with the strong-rooted perennial grasses until the latter have been partially displaced by the breaking of the sod; but when once it obtains a foothold it spreads with great rapidity. The jointed rhachis of the head breaks readily into short pieces, each of which bears a few flowers with their widely spreading barbed arrows. Each fragment has a most persistent creeping power, which enables it to work its way through heavy clothing, and the densest of hair or wool. In this way the grains are carried by man and animals for long distances, and when finally the arrows are broken up, and the barbs come out, the seeds are dropped upon the ground, ready to start up in early spring.

Tumble-weeds abound everywhere now, but I am confident that they are likewise dependent for their present abundance upon man's agency in breaking the original sod. The most common tumble-weed is *Amarantus albus* L., well known throughout the prairies and plains. Wherever a settler has broken up a tract of land these plants appear in great numbers; in fact it is principally upon such breakings that they are to be found. In the autumn I have seen great tracts of from fifty to a hundred acres or more entirely covered with the hemispherical or almost spherical examples of these tumble-weeds. With the advent of the frosts and heavy winds of October and November, the stems are broken off at the ground, or in some cases the root is pulled up or twisted off, setting free the round body, which then goes tumbling and bounding over the plains, scattering its seeds as it goes. Whether these tumble-weeds occur as depauperate plants upon the plains, intermingled with the grasses, I do not know, but it is certain that none occur there large enough to roll and tumble. The plant is not a *tumble* weed until it has the opportunity of growing freely upon broken and disturbed soil.

A second tumble-weed is *Cycloloma platyphyllum* Moq. It grows in almost exactly the same way as the preceding. I first observed it along the Platte River, where it covered acre after acre of the sandy river border. It occurs also on the upper Elkhorn River and the lower and middle portion of the Niobrara. However, upon the upper Niobrara and in the White River country the only tumble-weed is *Amarantus albus.* Probably this second plant (Cycloloma) has for a long time been a tumble-weed upon the plains, especially on those portions adjacent to the streams mentioned. Both species will increase in numbers for a few years, during the time when settlers are breaking up large tracts of the prairie sod, and then, as better and more continuous culture is practiced, they will gradually decrease in number and importance.—*Charles E. Bessey.*

ASH RUST IN 1888.—The Ash-rust, *Æcidium fraxini,* has been very abundant on *Fraxinus viridis* in Lincoln, Neb., this year. It was especially common in the latter part of June and first week of July. At that time I observed a number of trees of which almost every leaf (as also in many cases were the petioles) was affected to such a degree that many of them were curled and distorted. This has some interest from the fact that, although abundant in 1885, this rust was rare in 1886 and 1887.—*N. R. Pound.*

HOUGH'S AMERICAN WOODS.—During the summer Mr. Romeyn B. Hough, of Lowville, N. Y., brought out Part I. of his proposed work on American Woods, exhibited by actual specimens, and with a copious explanatory text.

The specimens, of which there are twenty-seven, consist of three thin sections, viz., transverse, radial, and tangential, each about four and a half inches by one and three quarters. They are neatly mounted in black cardboard frames, six by nine inches. Upon these frames are printed the scientific name, the various English, German, French and Spanish popular names.

The text is a pamphlet of eighty pages, neatly printed, and illustrated with forty-two wood-cuts. The introductory portion includes an account of the structure of the stem leaf, inflorescence, flower, fruit and seed, with definitions of the technical terms necessarily used in their description. There is also a short discussion of the physical properties of woods. Then follows an index-glossary. Forty pages are devoted to a systematic study of the species represented in the sections. Under each species there is first a specific description of the tree given in quite popular language; then follow geographical distribution, physical properties, uses, medicinal properties, etc. Accompanying this part are three keys to the species: the first based mainly upon the flowers, the second upon the leaves, and the third upon the fruit. The work will be a most valuable one, and it is to be hoped that it will be continued to completion. Every botanical department ought to afford this set, as the price ($5 per volume) is very reasonable. The volumes are put up in book form, so that they may be placed upon ordinary library shelves.—*Charles E. Bessey.*

ZOOLOGY.

THE CONTRACTILE VACUOLE.—The dispute regarding the nature of the contractile vacuole in the protozoa is not at an end. Dr. De Bruyne records (*Bulletin Roy. Acad. Sci. Belg.* LVI., 1888), his belief that it does not communicate with the exterior, and that it is not possessed of excretory functions. Prolonged study tends to show that the contained fluid is not expelled from the protozoan, but that it is forced to other parts, to again return to form the vacuole. He would rather regard it as of respiratory and circulatory functions and thinks that the contained fluid may possibly have nutrient properties.

AN ENDOPARASITE OF AMPHIURA.—Dr. Fewkes records (*Proc. Boston Soc'y. Nat. Hist.*, XXIV., p. 31, 1888) the existence of a Copepod Crustacean parasitic in the brood cavity of the common Brittle Star, *Amphiura squamata,* at Newport, R. I. In the specimens affected the ovary had degenerated into an amorphous mass and that the cavity contained either the adult Copepod or eggs containing the young in all stages of development. Fewkes also records the existence of this parasite in another place (*Bulletin, M. C. Z.,* XIII., 1887) but does not give it a description or a name. Comparison should be made with *Cancerilla tubulata* which is described by A. Giard (*Comptes Rendus,* 1887, p. 1189) as parasitic *upon* the same brittle star at Fécamp. There the young attach themselves to the ends of the anus and approach the disc as they grow older.

THE CLASSIFICATION OF THE MYRIAPODA.—So far as I am aware, no naturalist has questioned the naturalness and homogeneity of the group of Myriapoda. To me it seems that this unity is apparent rather than real; that the Chilopods and Chilognaths are placed together on account of superficial resemblances, rather than from community of descent, upon which all true classification must be based, and that those features which they have in common are at the same time possessed by *all* the other air-breathing arthropods.